

REMARKS

The Final Office Action mailed January 22, 2004, has been received and reviewed.

Claims 1 through 67 are currently pending in the application. Claims 12 through 63 are withdrawn from consideration as being drawn to nonelected invention(s). Claims 1 through 11 and 64 through 67 stand rejected. Applicants have amended claim 1 and respectfully request reconsideration of the application as amended herein.

Information Disclosure Statement(s)

Applicants note the filing of an Information Disclosure Statement herein on October 20, 2003 and note that no copy of the PTO-1449 was returned with the outstanding Office Action. Applicants respectfully request that the information cited on the PTO-1449 be made of record herein.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 4,030,622 to Brooks et al. in View of U.S. Patent No. 5,911,461 to Sauter et al.

Claims 1 through 11 and 64 through 67 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Brooks et al. (U.S. Patent No. 4,030,622) in view of Sauter et al. (U.S. Patent No. 5,911,461). Applicants respectfully traverse this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections are improper because the references relied upon by the Examiner fail to teach or suggest all of the limitations of the presently claimed invention, because there is a lack of motivation to combine the references in the manner suggested by the Examiner, and because there is not a reasonable expectation of success.

Independent claim 1 is directed to a system for marking IC packages. The system comprises: *a plurality of trays, each tray being sized and configured to carry a plurality of discrete integrated circuit (IC) packages*; a transport actuator; *a tray carrier carried by, and unsecured to, the transport actuator for receiving at least one tray of IC packages of the plurality of trays*; an input shuttle assembly for providing the at least one tray of IC packages to the tray carrier; an output shuttle assembly for receiving the at least one tray of IC packages from the tray carrier; and *a laser marking station disposed adjacent a portion of the transport actuator between the input shuttle assembly and the output shuttle assembly*. Applicants submit that Brooks and Sauter fail to teach or suggest all of the limitations of claim 1.

The Examiner cites Brooks as teaching a transport actuator for receiving trays of an IC package, an input and output shuttle assembly for providing the trays of IC packages to and from the tray carrier and a laser marking station disposed adjacent a portion of the transport actuator between the input and output shuttle assemblies. The Examiner then cites Sauter as teaching a tray carrier unsecured to the transporter. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Brooks to utilize a tray for the wafer in order to reduce the danger of damage thereto. Applicants respectfully disagree.

Brooks teaches a system of transporting and handling silicon wafers. (Col. 1, lines 6 - 7). While the Examiner has characterized Brooks as teaching a transport actuator for receiving trays of IC packages, Applicants submit that Brooks fails to teach or suggest a *tray carrier* which is carried by, and unsecured to, the transport actuator for receiving trays of IC packages. Rather, Brooks teaches the loading of individual wafers (190) *directly onto a tongue* (210) in preparation for transporting the wafers along a vibratory track (30). A second tongue (210') assists in removal of the wafer from the track and into another cassette (214). (Col. 7, lines 5 - 39).

Not only does Brooks fail to teach or suggest a tray carrier, it also fails to teach or suggest a plurality of trays, each tray being sized and configured to carry a plurality of discrete IC packages. Rather, as noted hereinabove, Brooks teaches the loading of *individual wafers* (190) *directly onto a tongue*. No tray or tray carrier is taught or suggested by Brooks.

Furthermore, while the Examiner points to column 6, line 36 of Brooks as teaching a laser marking station, Applicants note that Brooks actually teaches an *ion beam* and fails to teach or suggest a laser marking station. More specifically, Brooks teaches the use of an “ion beam for selectively modifying the characteristics of a wafer.” (Col. 5, lines 14 - 16). Such characteristics are described by Brooks as being “electronic characteristic[s].” (Col. 1, lines 30 - 33). Applicants submit that one of ordinary skill in the art would recognize that an ion beam contemplates the formation of a beam of charged particles while, on the other hand, a laser is the formation of coherent light comprising photons which do not carry an electrical charge. Thus, one of ordinary skill in the art would not find the teachings of Brooks, regarding the selective modification of electronic characteristics of wafer by an ion beam, to suggest the existence of a laser marking station.

Applicants further submit that Sauter fails to teach a plurality of trays, each tray being sized and configured to carry a plurality of discrete integrated circuit (IC) packages. Nor does Sauter teach a *tray carrier* which is carried by, and unsecured to, the transport actuator for receiving at least one tray of IC packages of the plurality of trays. Rather, Sauter teaches a *wafer carrier* configured to carry a single wafer, not a *tray* which, in turn is configured to carry a plurality of discrete IC packages. Nor is there any teaching or suggestion by Sauter that the wafer carrier disclosed thereby be utilized in any manner to carry at least one tray of IC packages. Additionally, Sauter also fails to teach or suggest a laser marking station.

Not only do Brooks and Sauter fail to teach or suggest all of the limitations of claim 1 of the presently claimed invention, but there is also a lack of motivation to combine the references in the manner suggested by the Examiner. Furthermore, there is no reasonable expectation of success in combining Brooks with Sauter as proposed by the Examiner.

For example, Brooks teaches away from using either a tray or a tray carrier in its transport system. In discussing the existing state of the art, Brooks states that various techniques have previously been utilized to transport wafers into and out of sealed vacuum chambers including “rotary carousels, endless conveyor belts, movable carriages, etc.” (Col. 1, lines 41 - 43, emphasis added). Brooks states that such techniques are inadequate because “the *carriage element* must at some point penetrate the housing of the chamber, and the penetration points must therefore be sealed so as to isolate the chamber from its ambient environment.” (Col. 1, lines 44 - 47). In addressing this issue, Brooks teaches the sequential transport of wafers, *without any carrier mechanism*, along a defined path into the sealed chamber. By transporting a single wafer at a time without either a tray or tray carrier, Brooks teaches that it is easier to seal the air-tight chamber. Thus, placing the wafer in any type of tray or tray carrier for transport in the system disclosed by Brooks would render the system inadequate for its intended purpose as such trays would undoubtedly make it more difficult to seal the air-tight chamber.

With regard to Sauter, the carrier taught therein is explicitly described to support the *wafer* from therebeneath so as to avoid contact with the outer periphery or upper surface of the wafer. Sauter describes the wafer carrier as contacting the wafer “below an imaginary center plane 7 which is situated in the center of the wafer between the flat front side 5 and the flat rear side 6 of the semiconductor wafer.” (Col. 2, lines 56 - 59). Sauter teaches that this arrangement allows the wafer to be “coated in a reactor without the disadvantage that the coating is impaired at the rim of the front side by the presence of the carrier.” (Col. 2, lines 60 - 62).

Referring back to Brooks, Brooks teaches that the transport of wafers involves placing the wafers on a track which is “forced to undergo small amplitude vibrations” and that such vibrations have “a first displacement component perpendicular to the track which *repetitively lifts wafers momentarily out of contact with the track*, and a second displacement component directed long the track which advances the wafers along the track by a minute amount each time they are lifted off the track.” (Brooks, col. 3, 27-35, emphasis added). Aside from the fact that Brooks expressly teaches away from using a tray or tray carrier, utilizing the wafer carrier of Sauter with the mechanism of Brooks would render Brooks inoperable since the vibratory track would cause

shaking and displacement of the wafer relative to Sauter's carrier during transport. In order to overcome this problem, one would have to modify the wafer carrier such that it held the wafer at least by the edges, if not by the front surface so as to keep the wafer from sliding off of the carrier while on the vibratory transport track. Such a modification is in direct contrast with the express teachings of Sauter and would render the Sauter carrier inadequate for its intended purpose.

Additionally, such a modification of the Sauter device would likely be required since Brooks includes a platen (120) which is rotated to place a wafer in a vertical position for processing purposes. (Col. 6, lines 34 - 38). Without modifying the Sauter carrier, the wafer would slide out of the carrier when rotated by the platen of Brooks. Again, such a modification to Sauter would render the carrier inadequate for its intended purpose of exposing both the entire upper surface and the rim of the wafer during processing. There simply is no suggestion, in either Brooks or Sauter, to modify the Sauter device in such a way. Nor is there a reasonable expectation of success in combining the references as proposed by the Examiner.

Applicants note that if a "proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." (MPEP 2143.01, citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959), emphasis in original). As shown above, modification of the Sauter carrier would change the principle of operation of such a carrier. Failure to modify the Sauter carrier would result in an inoperable combination.

It is noted that the Examiner's stated motivation for combining Brooks and Sauter is to "reduce the danger of damage" to the wafer as set forth by Sauter. (See, Final Action, page 4). However, the Examiner has not indicated what "damage" might be prevented in Brooks' process by incorporating Sauter's carrier.

It is noted that the "danger of damage" referred to by Sauter includes "the danger that [a] growing layer [of a material] coating will produce a firm joint between the semiconductor wafers and the supporting surface on which the semiconductors are resting." (Sauter, col. 1, lines 34-37). Since the system of Brooks is not associated with a coating process such as is disclosed by Sauter, there is no danger of the type of damage which is to be prevented by Sauter's carrier.

Moreover, Applicants submit that the combination of Brooks' vibratory track with Sauter's carrier would actually *induce* damage in the semiconductor wafer since it is likely that the wafer would bounce around on the carrier and be jostled resulting in potential scratches or other physical damage inflicted by the carrier on the surface of the wafer.

While the Examiner states that Applicants previously stated arguments attack the references individually rather than the combination thereof, Applicants submit that the above arguments go specifically to the *resulting combination* of Brooks and Sauter showing that each reference teaches away from combination with the other and, further, that such references teach away from the presently claimed invention.

Thus, Applicants submit that Brooks and Sauter fail to teach and suggest all of the limitations of claim 1 of the presently claimed invention, that there is a lack of motivation to combine the references, and that there is no reasonable expectation of success in combining Brooks and Sauter as proposed by the Examiner.

As such, Applicants submit that claim 1 is clearly allowable over the combination of Brooks and Sauter. Applicants further submit that claims 2 through 11 and 64 through 67 are allowable as being dependent from an allowable base claim as well as for the additional patentable subject matter introduced thereby.

With respect to claim 2, Applicants submit that neither Brooks nor Sauter teach or suggest a *tray transport* having the *tray carrier* disposed thereon without securement thereto.

With respect to claims 3-11, Applicants submit that neither Brooks nor Sauter teach or suggest that the upper surface of a *tray transport* and a lower surface of a *tray carrier* have mutually cooperative physical features. While the Examiner appears to cite Sauter as disclosing such subject matter, Applicants submit that Sauter only discloses a *wafer carrier* having an edge which contacts a beveled edge of the *wafer* at a conformal angle which teaching fails to teach or suggest the subject matter set forth in claim 3 of the presently claimed invention.

With respect to claims 4-11, Applicants submit that neither Brooks nor Sauter teach or suggest that the mutually cooperative physical structures are adapted to align the *tray carrier* on the *tray transport* when the tray carrier is disposed thereon.

With respect to claims 5 through 11, Applicants submit that neither Brooks nor Sauter teach or suggest that portions of the mutually cooperative physical structures provide a fulcrum for tilting of the *tray carrier* with respect to the *tray transport*. While the Examiner generally cites Sauter as teaching such subject matter, Applicants fail to find any specific teaching. Furthermore, Applicants submit that if the wafer carrier of Sauter was tilted relative to any transport on which it may be disposed (although Sauter provides no teaching or suggestion of such) the wafer held thereby would likely slip off the carrier due to its configuration as discussed above. As such, Applicants submit that Sauter teaches away from the presently claimed invention.

With respect to claims 6 and 7, Applicants submit that neither Brooks nor Sauter teach or suggest that the *tray transport* is rectangular, but for a corner severed therefrom adjacent the fulcrum. While the Examiner points to FIG. 4 of Sauter, Applicants fail to find such subject matter disclosed thereby.

With respect to claim 7, Applicants submit that neither Brooks nor Sauter teach or suggest a lifting device extendable to contact the *tray carrier* at a location remote of the fulcrum.

With respect to claims 8 through 11, Applicants submit that neither Brooks nor Sauter teach or suggest that the *tray transport* is of lesser longitudinal extent than the *tray carrier*.

With respect to claim 9, Applicants again submit that neither Brooks nor Sauter teach or suggest that the *tray transport* is rectangular, but for a corner severed therefrom adjacent the fulcrum.

With respect to claims 10 and 11, Applicants again submit that neither Brooks nor Sauter teach or suggest a lifting device extendable to contact the *tray carrier* at a location remote of the fulcrum.

With respect to claim 11, Applicants submit that neither Brooks nor Sauter teach or suggest a lifting device which is extendable from a location below the *tray carrier* and adjacent a longitudinal end of the *tray transport*.

With respect to claims 64 through 67, Applicants submit that neither Brooks nor Sauter teach or suggest a *tray carrier* which is substantially rectangular and includes a substantially

planar upper surface having upwardly extending stops at each corner thereof. While the Examiner points to FIG. 4 of Sauter, Applicants fail to find such subject matter disclosed thereby.

With respect to claims 65 through 67, Applicants submit that neither Brooks nor Sauter teach or suggest a *tray carrier* which includes a portion of reduced width defined by mutually longitudinally coextensive elongated notches in parallel sides thereof. While the Examiner points to FIG. 4 of Sauter, Applicants fail to find such subject matter disclosed thereby.

With respect to claims 66 and 67, Applicants submit that neither Brooks nor Sauter teach or suggest a *tray carrier* which includes a plurality of downwardly facing notches in the two parallel sides thereof. While the Examiner points to FIG. 4 of Sauter, Applicants fail to find such subject matter disclosed thereby.

With respect to claim 67, Applicants submit that neither Brooks nor Sauter teach or suggest that the plurality of downwardly facing notches in the *tray carrier* comprises two notches on each of the two parallel sides of the tray carrier. While the Examiner points to FIG. 4 of Sauter, Applicants fail to find such subject matter disclosed thereby.

Applicants, therefore, respectfully request reconsideration and allowance of claims 1 through 11 and 64 through 67.

ENTRY OF AMENDMENTS

The proposed amendments to claim 1 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application.

CONCLUSION

Claims 1 through 11 and 64 through 67 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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